

season. In July, 1902, the plants were fairly abundant in the same field.

*H. hyperborea*, R. Br. In a swamp near the Plains, also in one swamp two miles farther south.

*H. dilatata*, Gray. Plenty on a bog in an open grassy space near the Plains.

*H. obtusata*, Richard. Abundant in a cold wooded swamp near the Plains.

*H. Hookeri*, Torr. In dry woods near North Chesterville, also on the side of the Ridge.

*H. orbiculata*, Torr. Not uncommon in rich woodlands.

*H. blephariglottis*, Torr. Plenty in two bogs, a few plants having been found on a third.

*H. lacera*, R. Br. Frequent in old fields.

*H. psycodes*, Gray. Fairly common in meadows and roadside ditches.

*H. fimbriata*, R. Br. Very abundant in wet soil in open woods. I have also found the pale and white forms.

*Cypripedium pubescens*, Willd. Occasional in wet woods.

*C. acaule*, Ait. Common in evergreen forest.

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## OBSERVATIONS ON ECHINODORUS PARVULUS.

EDWARD L. RAND.

(Plate 45, figures 4 and 5.)

WINTER POND in Winchester, near Boston, Massachusetts, has long been known as a station for the rare little plant, *Echinodorus parvulus*, Engelm. Of late years, however, for one reason or another, the plant has not often been found here by botanists, so that some question had arisen whether it had not become very scarce or perhaps disappeared. Such, fortunately, has proved not to be the case, for on October 13th, 1901, and subsequently, Mr. E. F. Williams and I found it in abundance. Our first trip to the pond, although late in the season was well timed. Very little rain had fallen for several weeks, and in consequence, the water in the pond was, I

judge, somewhat below, or certainly as low as its summer level. If indeed, the water had been a very little higher, nearly all the plants of *Echinodorus* would have been partly or wholly submerged.

We first found very small plants growing on the shore in soft mud. These showed occasional flowers and much fruit, as might have been expected at this season of the year. Afterwards we found larger terrestrial plants, and submersed plants also, the latter growing often nearly a foot under water. Thus a good opportunity was given for observing the plant in its various forms. Certain of its characters omitted from botanical descriptions seem worthy of record here.

Many of the terrestrial plants, especially those not far from the water's edge, showed traces of decaying leaves at the base of the fresh green lanceolate or spatulate leaves mentioned in all the descriptions. By tracing plants to the water it was found that these decaying leaves were the remains of their pellucid, membranous phyllodia, which are the submersed primary leaves of the plant. These phyllodia form almost its entire foliage until through lowering of the water level the plant emerges, when they soon decay. The secondary or terrestrial leaves, which have already begun to show themselves while the plant is in shallow water, then rapidly develop. When fresh, the phyllodia are lance-linear, tapering to a point, 2 to 3 cm. long and 2 to 3 mm. broad, with no distinction of blade and petiole. So far as I am aware these submersed leaves have not been definitely mentioned in descriptions of this plant, except in the first edition of Gray's Manual, where, however, under the name *E. subulatus*, Engelm., the species was confused with *Sagittaria pusilla*, Nutt.

In one part of the pond *Echinodorus* was growing in a depth of from half a foot to a foot of water on a cleaner, more sandy bottom. Here it was easy to study the plants in their submersed form. Not only were the phyllodia, I have mentioned, conspicuous, but also the creeping and proliferous character of the shoots. A number of colonies of three or four connected plants were observed. Here I was surprised to find also a number of plants with fresh, newly opened flowers some distance under water. Although *Echinodorus* does not appear to be so true an aquatic as *Subularia* it seems that it does sometimes bloom in its submersed state. How constant this character is, may be a good subject for investigation. It is certain the plant normally develops its flower buds sometimes in a depth of water that practically permits little chance for aërial anthesis.

The lateness of the season of course gave me an excellent opportunity to examine the plant in full fruit. After a careful examination of many plants I failed to find any trace of that regularity of arrangement of the achenes on the receptacle attributed to this species of *Echinodorus* in some botanical works. There seems, therefore, no cause to refer the species to *Alisma*, as several authors have done.

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## THE GENERIC POSITION OF ECHINODORUS PARVULUS.

B. L. ROBINSON.

(Plate 45, figures 1-10.)

WHILE examining some excellent material of the rare *Echinodorus parvulus*, Engelm., kindly placed at my disposal by E. L. Rand, Esq., I have had occasion to review the opinions, which have been expressed regarding the correct classification of this species, and some notes on the subject may be of interest.

The North American plant bearing this name was originally described by Dr. George Engelmann<sup>1</sup> as *Echinodorus subulatus*. It was so named under the impression that it was the *Alisma subulatum* of Linnaeus,<sup>2</sup> a species which later proved to be *Sagittaria pusilla*, Nutt. Our little *Echinodorus* was accordingly rechristened by Engelmann<sup>3</sup> and called *E. parvulus*. The propriety of this change can scarcely be questioned when we consider that the earlier name, *E. subulatus*, rested upon a confusion of two quite distinct elements, namely, the synonym *Alisma subulatum* and a true *Echinodorus*. In such cases it may be assumed that the status of the combination should be determined rather by the name-bearing synonym than by the material which was erroneously identified with it.

*Echinodorus parvulus* matures about fourteen carpels, which being arranged spirally upon a strongly convex receptacle form a

<sup>1</sup> Engelm. in Gray, Man. ed. 1, p. 460 (1848).

<sup>2</sup> Spec. Pl. i. 343 (1753).

<sup>3</sup> Engelm. in Gray, Man. ed. 2, p. 438 (1856).